UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,189	07/30/2003	Nathaniel McIntosh	200311156-1	3955

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EXAMINER
WOOD, WILLIAM H

ART UNIT	PAPER NUMBER
2193	

DATE MAILED: 07/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
	10/632,189	MCINTOSH ET AL.
Office Action Summary	Examiner	Art Unit	
	William H. Wood	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>30 July 2003</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-22 are pending and have been examined.

Claim Rejections - 35 USC § 101

1.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2.   Claim 8 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 8 comprises of a compiler and a linker, which are reasonably interpreted as software. The claim does not recite any structure or functionality of a "computer system" (found in line 1 of the claim). Therefore, the claim is non-statutory as being only software.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claims 1, 6-9, 14-16 and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by **Yui** (USPN 6,134,708).

Claim 1

Yui disclosed a method for automatically reordering variables, the method

comprising:

    as a part of compilation,

        identifying a set of variables that are candidates for reordering,

wherein the candidate variables are associated with one or more source

code files that are being compiled _(figure 1, element 20; column 5, lines 5-_

21; "The in-task variable processing means sets the group information");

        collecting data for determining a potential layout for the candidate

variables _(column 5, lines 22-27; symbol table passes information)_;

as a part of linking,

        determining the potential layout based, at least in part, on the data

(column 5, lines 28-31); and

        reordering the variables based, at least in part, on the potential

layout _(column 5, lines 31-35; groups variables)_.

Claim 6

Yui disclosed the method of claim 1, wherein the data is stored in one or more

object files associated with the one or more source code files _(figure 1, elements_

10 and 40), and wherein the method further comprises:

    transmitting the data to a linker by transmitting the object files to the

linker _(figure 1, elements 20, 40 and 50)_.

Claim 7

Yui disclosed the method of claim 1, wherein:

the method further comprises, summarizing, during linkage, the data associated with the one or more source code files *(column 5, lines 34-37; allocation based on the symbol table data)*; and

the step of determining further comprises, determining the potential layout, at least in part, based on the summarized data *(column 5, lines 37-42; generation based off of the allocation)*.

Claim 8

The limitations of system claim 8 correspond to the limitations of method claim 1 and as such are rejected accordingly.

Claims 9 and 14-15

The limitations of system claims 9 and 14-15 correspond to the limitations of method claim 1 and as such are rejected accordingly.

Claims 16 and 21-22

The limitations of claims 16 and 21-22 correspond to the limitations of method claim 1 and as such are rejected accordingly.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or
> described as set forth in section 102 of this title, if the differences between the subject
> matter sought to be patented and the prior art are such that the subject matter as a whole
> would have been obvious at the time the invention was made to a person having ordinary
> skill in the art to which said subject matter pertains. Patentability shall not be negatived by
> the manner in which the invention was made.

6.   Claims 2-5, 10-13 and 17-20 are rejected under 35 U.S.C. 103(a) as

being unpatentable over **Yui** (USPN 6,134,708) in view of **Caldwell** (USPN

5,940,621).

Claim 2

Yui did not explicitly state the method of claim 1, wherein determining the

potential layout further comprises: selecting the next variable to associate with

a virtual cache line based on more than one variable already associated with

the virtual cache line; and indicating that the selected variable is the next

variable associated with the potential layout. **Caldwell** demonstrated that it

was known at the time of invention to allocate variables based upon already

existing variable in a cache line (column 3, lines 45-47). It would have been

obvious to one of ordinary skill in the art at the time of invention to implement

the virtual memory allocation system of **Yui** with associating a variable with a

cache line based upon another variable and then actually performing/

indicating the association as found in **Caldwell's** teaching. This

implementation would have been obvious because one of ordinary skill in the

art would be motivated to reduced cache retrieves and thus improve memory

access (**Caldwell**: column 3, lines 47-52; "the need to retrieve additional cache

lines is greatly reduced").

Claim 3

Yui did not explicitly state the method of claim 1, wherein:

the method further comprises, partitioning the candidate variables into

categories, based at least in part on the data, wherein the categories include at

least one of a small read-only category, a large read-only category, a small

writeable category, a large initialized writeable category, and a large

uninitialized writeable category; and

the step of determining further comprises, determining the potential

layout, at least in part, based on the categories of the candidate variables.

Caldwell demonstrated that it was known at the time of invention to allocate

variables based upon size of variables (column 5, lines 14-22) and thus

categories of size (readable to at least one category including "writeable

category"; further note column 5, lines 22-29). It would have been obvious to

one of ordinary skill in the art at the time of invention to implement the virtual

memory allocation system of **Yui** with allocating a variable based upon size

categories and then actually performing/ indicating the association as found in

Caldwell's teaching. This implementation would have been obvious because

one of ordinary skill in the art would be motivated to improve memory access

(**Caldwell**: column 5, line 36 to column 6, line 7).

Claim 4

Yui disclosed the method of claim 1, wherein the data includes at least one of

variable access counts, variable affinities, variable alignment constraints,

variable classifications, and the candidate variables. **Caldwell** demonstrated

that it was known at the time of invention to provide data including at least one

variable classifications (***Caldwell***: *column 6, lines 11-24; note Type and Size;*

column 5, liens 14-22). It would have been obvious to one of ordinary skill in

the art at the time of invention to implement the virtual memory allocation

system of **Yui** with variable classifications as found in **Caldwell**'s teaching.

This implementation would have been obvious because one of ordinary skill in

the art would be motivated to improve memory access (**Caldwell**: column 5,

line 36 to column 6, line 7).

Claim 5

Yui and **Caldwell** disclosed the method of claim 4 as indicated above, wherein

the variable classifications includes at least one of variable size, initialization

class, and storage class *(**Caldwell***: *column 6, lines 11-24; note Type and Size)*.

Claims 10-13

The limitations of system claims 10-13 correspond to the limitations of method

claim 1 and as such are rejected accordingly.

Claims 17-20

The limitations of claims 17-20 correspond to the limitations of method claim 1
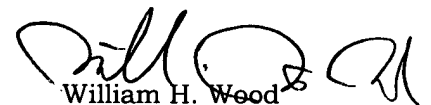
and as such are rejected accordingly.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Wood whose telephone number is (571)-272-3736. The examiner can normally be reached 9:00am - 5:30pm Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (571)-272-3719. The fax phone numbers for the organization where this application or proceeding is assigned are (571)273-8300 for regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained form either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR systems, see http://pair-direct.uspto.gov. For questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

William H. Wood
Patent Examiner
AU 2193
June 26, 2006